

# Quality Reference Framework (QRF) for the Quality of Massive Open Online Courses (MOOCs)

Citation for published version (APA):

Stracke, C. M., Tan, E., Moreira Texeira, A., do Carmo Pinto, M., Vassiliadis, B., Kameas, A., Sgouropoulou, C., & Vidal, G. (2018). *Quality Reference Framework (QRF) for the Quality of Massive Open Online Courses (MOOCs): Developed by MOOQ in close collaboration with all interested parties worldwide*. MOOQ. <http://www.mooc-quality.eu/QRF>

## Document status and date:

Published: 01/01/2018

## Document Version:

Publisher's PDF, also known as Version of record

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- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

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# Quality Reference Framework (QRF) for the Quality of MOOCs

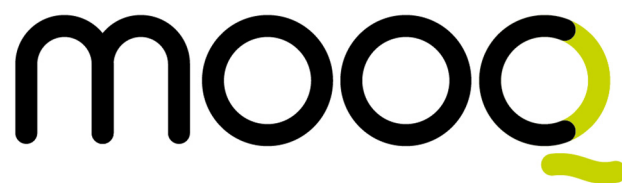
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# Quality Reference Framework (QRF) for the Quality of MOOCs

Developed by MOOQ in close collaboration  
with all interested parties worldwide



<http://www.mooc-quality.eu>

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# Quality Reference Framework (QRF) for the Quality of Massive Open Online Courses

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### Contributors:

Hundreds of MOOC experts, learners, designers, facilitators and providers have contributed to the QRF development through their participation in the:

- Global MOOC Quality Surveys realized by MOOQ
- Semi-structured interviews conducted by MOOQ and
- MOOQ Workshops at international conferences.

### Please cite as:

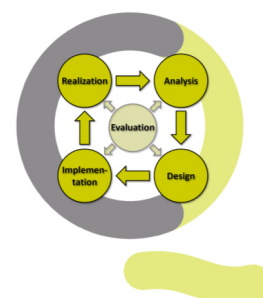
< Stracke, C. M., Tan, E., Teixeira, A., Pinto, M., Vassiliadis, B., Kameas, A., Sgouropoulou, C., & Vidal, G. (2018). *Quality Reference Framework (QRF) for the Quality of Massive Open Online Courses (MOOCs)*. Online available at [www.mooc-quality.eu/QRF](http://www.mooc-quality.eu/QRF) >



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## Executive Summary

This document contains the **Quality Reference Framework (QRF)** developed by the European Alliance for the Quality of Massive Open Online Courses (MOOCs), called MOOQ.



The Quality Reference Framework consists of three dimensions:

<b>Dimension 1: Phases</b>	Analysis, Design, Implementation, Realization, Evaluation
<b>Dimension 2: Perspectives</b>	Pedagogical, Technological, and Strategic
<b>Dimension 3: Roles</b>	Designer, Facilitator, and Provider

It is most important to note that MOOC designers, facilitators and providers have to select the appropriate and relevant phases and processes according to their situation, the learning objectives, target groups, context and conditions. Some processes are already decided and (partly or completely) defined by pre-conditions and requirements (e.g., the available resources, budget and staff).

In addition, the Quality Reference Framework provides the **QRF Key Quality Criteria** and the **QRF Quality Checklist** for designing and developing MOOCs. Main target groups of the Quality Reference Framework are the designers, facilitators and providers of MOOCs as well as the MOOC learners.

The Quality Reference Framework can be used to analyse the needs and demands for MOOCs, to design, develop and implement new MOOCs and to evaluate and improve existing MOOCs.

The main benefits of the Quality Reference Framework are:

- It provides a generic framework that can be adapted to each specific context.
- It identifies key quality criteria for better orientation on the MOOC design.
- It presents a checklist for the quality development and evaluation of MOOCs.
- It enables a continuous improvement cycle for MOOC design and provision.

The Quality Reference Framework is based on the International ISO standard ISO/IEC 40180 (former ISO/IEC 19796-1) and the results from the mixed methods research by MOOQ.

MOOQ has achieved huge impact at the local, regional, European and international levels: MOOQ could reach out to more than 100,000 MOOC learners, designers, facilitators and providers through the MOOQ dissemination and exploitation activities.

In addition, in close cooperation with European and international institutions and associations, MOOQ could involve in the QRF finalization more than 10,000 MOOC learners, designers, facilitators and providers through the Global MOOC Quality Survey, the MOOQ presentations and workshops at regional, European and international conferences as well as communication and collaboration in traditional channels and social media.

# 1. Introduction to the QRF

The Quality Reference Framework (QRF) was designed and organized by MOOQ, the European Alliance for the quality of Massive Open Online Courses (MOOCs). The QRF provides quality criteria and a checklist for designing MOOCs. They were discussed and developed in close collaboration with all interested international stakeholders involving more than 10,000 MOOC learners, designers, facilitators and providers through the mixed methods research, the MOOQ presentations and workshops as well as communication and collaboration in traditional channels and social media. Their contributions and evaluation led to valuable tools for designers, facilitators and providers to improve future MOOCs for learners worldwide.

Desktop research and literature review as well as the findings from the Global MOOC Quality Survey and 36 semi-structured interviews were instrumental in the iteration and progressive refinement of the QRF. In addition, the contributions and feedback from the participants of the MOOQ workshops at the following international conferences were integrated into the QRF:

- ICDE 2015 in Sun City, South Africa
- OE Global 2016 in Krakow, Poland
- EC-TEL 2016 in Lyon, France
- OE Global 2017 in Cape Town, SA
- IEEE EDUCON 2017 in Athens, Greece
- ICALT 2017 in Timisoara, Romania
- EARLI 2017 in Tampere, Finland
- EC-TEL 2017 in Tallinn, Estonia

Furthermore the QRF was used in the design for the two MOOQ MOOCs what provided valuable feedback, too.

## 1.1 Target groups of the QRF

Main target groups are the designers, facilitators and providers of MOOCs as well as the MOOC learners.

## 1.2 Usage and benefits of the QRF

The QRF can be used to analyse the needs and demands for MOOCs, to design and implement new MOOCs and to evaluate and improve existing MOOCs. The main benefits of the QRF are:

- It provides a generic framework that can be adapted to each specific context.
- It identifies key quality criteria for better orientation on the MOOC design.
- It presents a checklist for the quality development and evaluation of MOOCs.
- It enables a continuous improvement cycle for MOOC design and provision.



## 2. Overview of the Quality Reference Framework

This section provides an overview of the Quality Reference Framework. The QRF consists of three dimensions including quality criteria and instruments:

Table 1: Dimensions of the Quality Reference Framework

<b>Dimension 1: Phases</b>	Analysis, Design, Implementation, Realization, Evaluation
<b>Dimension 2: Perspectives</b>	Pedagogical, Technological, and Strategic
<b>Dimension 3: Roles</b>	Designer, Facilitator, and Provider

### 2.1 QRF Dimension 1: Phases

The first dimension of the QRF defines the phases.

The QRF consists of five phases:



**1. Analysis (A):** identify and describe requirements, demands and constraints



**2. Design (D):** conceptualise and design the MOOC



**3. Implementation (I):** implement a MOOC draft and finalize it through testing



**4. Realization (R):** realise and perform the MOOC including support and assessment



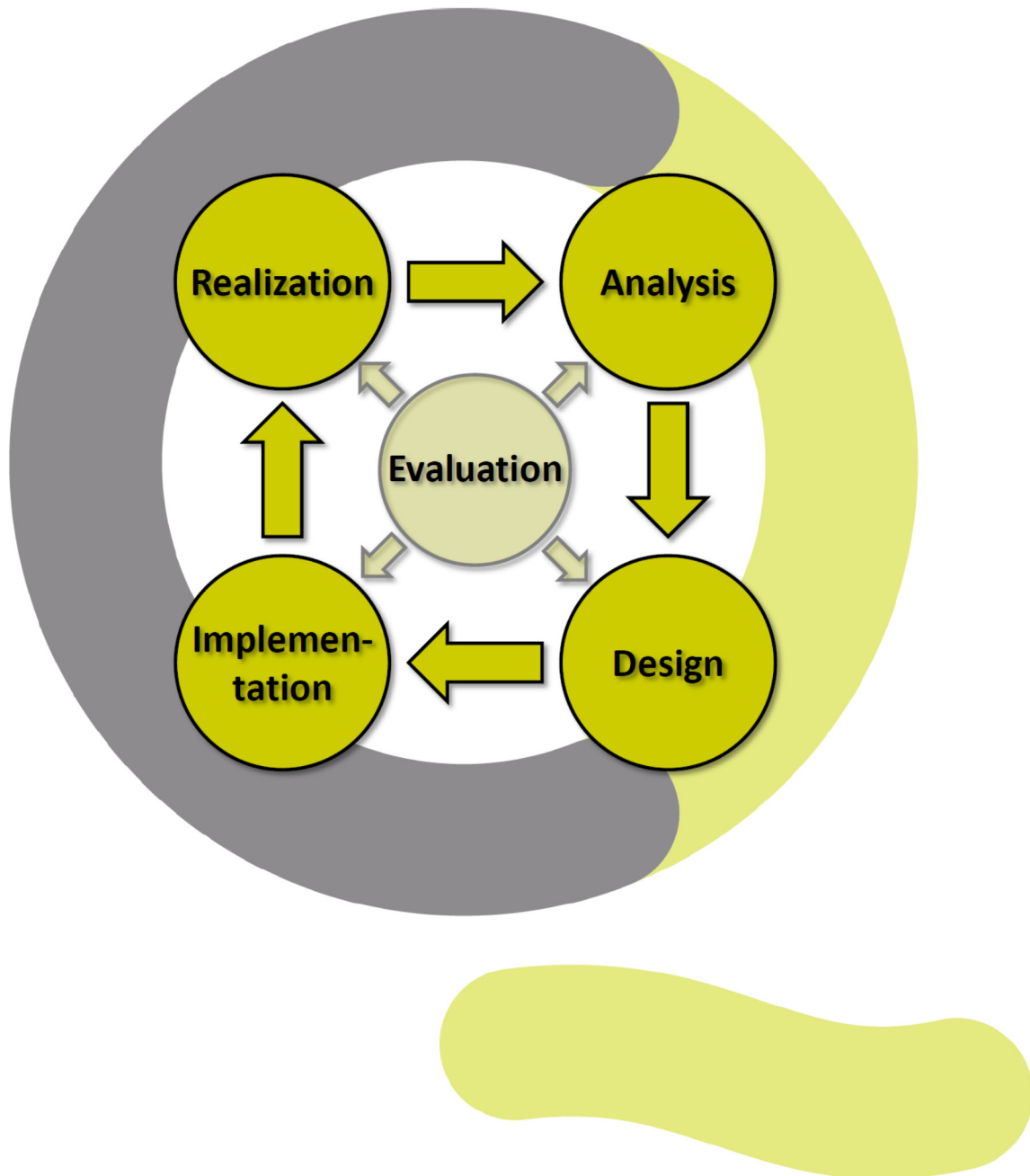
**5. Evaluation (E):** define, run and analyse the evaluation and improve the MOOC

The phases can be and are often processed in parallel. They are dependent of each other what is often leading to iterative cycles and progressive refinement. Each phases consists of several processes, e.g., "A-1 Initiation" as first process of the analysis phase.

The evaluation phase can and should already start at the beginning of the planning and designing of the MOOC. The evaluation addresses all other four phases to allow a formative evaluation of all processes. Therefore, the evaluation can ensure a continuous improvement cycle during all phases and the whole development of the MOOC.

The figure below illustrates the five phases:

Figure 1: The phases of the Quality Reference Framework (QRF)



Each phase consists of several quality criteria that are described in details in the following section below.



## 2.2 QRF Dimension 2: Perspectives

The second dimension of the QRF defines the three core perspectives.

The QRF covers the following three main perspectives:

### 1. Pedagogical



### 2. Technological



### 3. Strategic



Each perspective has to be considered and addressed in the five phases. A detailed description of the quality criteria in each of the five phases can be found in section 3.

## 2.3 QRF Dimension 3: Roles in MOOCs

The third dimension of the QRF defines the roles in MOOCs.

The QRF focuses the following three main roles:

### 1. Designer



### 2. Facilitator



### 3. Provider



Roles are clustered into these three core groups as follows:

#### Designer:



Designer includes content experts, content authors, instructional designers, experts for MOOC platforms, technology-enhanced learning and digital media and any others who may contribute to the design of a MOOC.

#### Facilitator:



Facilitator includes the pedagogical facilitators and experts with content knowledge (such as moderators, tutors, teaching assistants) who manage forum, provide feedback and monitor learning progress, technical facilitators (such as technical support for learners) and others who may contribute to support participants in their learning process in a MOOC.

#### Provider:



Provider includes (internal and external) MOOC providers, technical providers (such as technology providers, programmers, software designers and developers), managers, communication and marketing staff and others who are involved in the decision-making processes leading to the delivery of a MOOC.

### 3. The Quality Reference Framework

This section presents the Quality Reference Framework (QRF) and provides a detailed description of the QRF phases and processes, perspectives and roles embodied in the QRF.

The QRF, its phases and processes, perspectives and roles are premised on the following:

- The International ISO standard ISO/IEC 40180 (former ISO/IEC 19796-1) adapted to the specific requirements and needs for MOOCs;
- Results from the Global MOOC Quality Surveys realized by MOOQ;
- Results from the semi-structured interviews conducted with MOOC experts by MOOQ;
- Feedback from the MOOQ Workshops at international conferences.

It is most important to note that MOOC designers, facilitators and providers have to select the appropriate and relevant phases and processes according to their situation, the learning objectives, target groups, context and conditions. Some processes are pre-specified and (partly or completely) defined by pre-conditions and requirements (e.g., the available resources, budget and staff). Nevertheless, it is recommended to document also these processes defined by pre-conditions and requirements to ensure all involved stakeholders are duly informed.

Table 2 presents the **Quality Reference Framework (QRF)** with its three dimensions:

1. **The Phases and Processes** (in the rows of the table):



Analysis



Design



Implementation



Realization



Evaluation

2. **The Perspectives** (after each process quality criteria in brackets):



Pedagogical (P)



Technological (T)



Strategic (S)

3. **The Roles** (in the columns of the table):



Designer














Facilitator



Provider

Legend: For the phases: "A-1" is a process  
For the roles: R = Responsible - X = Involved

Table 2: **The Quality Reference Framework (QRF)**

 <b>Analysis</b>				
A-1	Initiation   			R
A-2	Stakeholder identification  	X		R
A-3	Definition of objectives   	R		R
A-4	Needs and demand analysis  	X		R
A-5	Analysis of the external context  			R
A-6	Analysis of the organizational context   	X		R
A-7	Time, resources and budget planning  	X		R










































 <b>Design</b>				
D-1	Learning objectives  	R	X	X
D-2	Organizational concept and roles   	R	X	X
D-3	Didactical concept and methods  	R	X	X
D-4	Concept for contents   	R	X	X
D-5	Concept for learning activities 	R	X	
D-6	Technical concept   	X	X	R
D-7	Media design  	R	X	X
D-8	Communication concept  	R	X	
D-9	Interaction concept  	R	X	
D-10	Feedback concept  	R	X	
D-11	Concept for tests and assessment   	R	X	X













Table 2: **The Quality Reference Framework** (continued)

Implementation				
I-1	Content realization  	R	X	X
I-2	Design realization  	R		X
I-3	Media realization  	R		X
I-4	Technical realization  	X		R
I-5	Organization of use 	X	X	R
I-6	Testing and activation  	R		X

Realization				
R-1	Administration  	X	X	R
R-2	Learning activities and related support   	X	R	X
R-3	Review of competence levels   	R	X	X

Evaluation				
E-1	Evaluation planning  	X	X	R
E-2	Evaluation realization   	X	X	R
E-3	Evaluation review  	R	X	X
E-4	Improvements and optimization  	X	X	R

The following two sub-sections provide:






1. The **QRF Key Quality Criteria** for a MOOC
2. The **QRF Quality Checklist** with its phases, processes, perspectives and roles.




### 3.1 The QRF Key Quality Criteria

The following table presents the QRF Key Quality Criteria for analysing, designing, implementing, realizing and evaluating a MOOC. The quality criteria are defined as action items for potential activities in the different processes.

As aforementioned, it is most important to note that MOOC designers, facilitators and providers have to select the appropriate and relevant phases and processes according to their situation, the learning objectives, target groups, context and conditions. The same applies to the QRF Key Quality Criteria. Some processes or some of their quality criteria are pre-specified and defined (partly or completely) by pre-conditions and requirements (e.g., the available resources, budget and staff). Nevertheless, it is recommended to document also these processes defined by pre-conditions and requirements to ensure all stakeholders involved are duly informed.

Moreover, as already mentioned above, the QRF phases and processes are based on the adapted international ISO standard ISO/IEC 40180 (former ISO/IEC 19796-1). The QRF Key Quality Criteria for the five phases and their processes are derived from the results of the Global MOOC Quality Surveys, the semi-structured interviews and the workshops at international conferences organized by MOOQ.

Legend: For the phases:  = Analysis -  = Design -  = Implementation  
 = Realization -  = Evaluation  
"A-1" is a process

For the perspectives:  = Pedagogical -  = Technological -  = Strategic  
(P) = Pedagogical - (T) = Technological - (S) = Strategic



































For the roles:  = Designer -  = Facilitator -  = Provider  
R = Responsible - X = Involved





Table 3: **The QRF Key Quality Criteria** in the phases and their respective processes








Analysis				
A-1	Initiation   			R
	<ul style="list-style-type: none"> <li>Assemble an incubation team (relevant personnel and expertise) to kick start the planning and development of the MOOC (P) (T) (S)</li> </ul>			R
	<ul style="list-style-type: none"> <li>Ensure diversity of the incubation team that each of the core stakeholders is represented (P) (T) (S)</li> </ul>			R
	<ul style="list-style-type: none"> <li>Re-use existing products and build on existing MOOC(s) (if applicable) (P) (T) (S)</li> </ul>			R
A-2	Stakeholder identification  	X		R
	<ul style="list-style-type: none"> <li>Identify the internal and external stakeholders (P) (S)</li> </ul>	X		R
	<ul style="list-style-type: none"> <li>Ensure each of the core stakeholders (e.g., content provider, designer, pedagogical and technical facilitator) is represented in the MOOC design and development team (P) (S)</li> </ul>	X		R
	<ul style="list-style-type: none"> <li>Identify target learners and groups in relation to content, IT competency, prior experience in online and e-learning (P) (S)</li> </ul>	X		R
A-3	Definition of objectives   	R	X	R
	<ul style="list-style-type: none"> <li>Define objectives of learning content based on entry level of target learners (content knowledge) (P) (S)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Define objectives of selected pedagogical model and instructional design based on learning content, learning objectives and target learners or target group (P) (T) (S)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Define objectives of learning activities based on entry level of target learners (prior experience in that specific pedagogical approach to be used for that said MOOC; cultural background; institutional culture, if applicable) (P) (S)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Define objectives of learning activities based on entry level of target learners (ICT competency) (P) (T) (S)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Define institutional objectives in offering the MOOC (e.g., profit, integration of the MOOC into main curriculum, etc.) (S)</li> </ul>	X	X	R








A-4	Needs and demand analysis  	R		X
	• Profile target learners and their entry levels (content knowledge) (P) (S)	R		X
	• Profile target learners and their entry levels (pedagogical experience and institutional culture, if applicable) (P) (S)	R		X
	• Profile target learners and their entry levels (ICT competency) (P) (T) (S)	R		X
A-5	Analysis of the external context  			R
	• Identify and source similar MOOCs (P) (S)			R
	• Identify potential partners for consultation and partnership (P) (S)			R
	• Assess the relevance and possibility of accreditation and (paid or free) certification (P) (S)			R
A-6	Analysis of the organizational context   	X		R
	• Analyse proficiency in curriculum, pedagogical and Instructional design required for the MOOC (P) (T)	X		R
	• Analyse proficiency in content knowledge required for the MOOC (P) (T)	X		R
	• Analyse proficiency in digital knowledge and skills required for the MOOC (P) (T)	X		R
	• Analyse sufficiency of the existing (institutional) IT infrastructure and the IT requirements to support the MOOC (S)	X		R
A-7	Time, resources and budget planning  	X		R
	• Estimate the duration and cost of staff and working hours in expert team to design and develop the MOOC (S)	X		R
	• Estimate the cost of production of learning materials, (IT) resources and staff to design and develop the MOOC (T) (S)	X		R
	• Estimate the cost of (IT) resources, staff, and hidden costs to run the MOOC (T) (S)	X		R
	• Develop a financial plan including a return on investment calculation and cost-benefit analysis (S)			



















 <b>Design</b>				
<b>D-1</b>	Learning objectives  	R	X	X
	<ul style="list-style-type: none"> <li>Define learning objectives based on the desired learning outcomes (e.g., acquisition of specific knowledge and skills) (P) (S)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Define learning objectives based on MOOC (P) (S)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Define target-group driven learning objectives (e.g., entry level in relation to content, IT competency, prior experience in online and e-learning environment) (P) (S)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Define learning objective(s) by the week, topic, lesson, sub-module, skill, competences, activity, task etc. (if applicable) (P)</li> </ul>	R	X	X
<b>D-2</b>	Organizational concept and roles   	R	X	X
	<ul style="list-style-type: none"> <li>Set up a team of content experts (with pedagogical coordinators) and technical experts (P) (T) (S)</li> </ul>	X	X	R
	<ul style="list-style-type: none"> <li>Define all roles required for the MOOC (P) (T) (S)</li> </ul>	X	X	R
	<ul style="list-style-type: none"> <li>Assign content experts to lead each theme, module, unit (if applicable) (P) (S)</li> </ul>	X	X	R
	<ul style="list-style-type: none"> <li>Assign facilitator(s) and define facilitation tasks (P) (S)</li> </ul>	X	X	R
<b>D-3</b>	Didactical concept and methods  	R	X	X
	<ul style="list-style-type: none"> <li>Define critical determinants of didactical approaches: Target learners, content, context and methodologies in relation to defined learning objectives (P) (T) Following are some of the didactical approaches used in MOOCs (list is not exhaustive):               <ul style="list-style-type: none"> <li>Combination of different design principles: 4CID, cognitive apprenticeship and network learning</li> <li>Learner-centered</li> <li>Network-based</li> <li>Competence-based</li> <li>Task-based</li> <li>Active-learning oriented</li> <li>Interactive-based approach</li> <li>Experiential learning</li> <li>Problem-based approach: case study</li> <li>Lectured-based approach: direct instruction using video lectures</li> <li>Specialised content: stimulation, problem solving</li> </ul> </li> </ul>	R	X	X










	<ul style="list-style-type: none"> <li>Define learning pace, personalisation and monitoring progress (P) (T)</li> </ul> <p>Provide the following (if applicable):</p> <ul style="list-style-type: none"> <li>Monitoring of one's learning progress: e.g., progress bar</li> <li>Possibilities to follow own learning path and pace</li> <li>Possibilities to adjust one's learning strategies</li> <li>A good range of optional activities</li> </ul>	R	X	
D-4	Concept for content   	R	X	X
	<ul style="list-style-type: none"> <li>Adopt a needs-driven approach (e.g., specific procedures to assess the market demand for a MOOC and its content) (P) (S)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Consider target learners and groups, motivation and entry levels (content knowledge and IT competence) (P) (T) (S)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Align learning objectives with course content and course duration (duration of 6 to 8 weeks is recommended) (P) (S)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Structure content (based on entry levels and prior knowledge – beginners, intermediate or advanced; novices, experts; size – units, modules) (P)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Ensure instructional alignment of course: learning objectives, module objectives, activities and assessments (P) (T)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Identify possible certification for different levels of completion (if applicable) (P) (S)</li> </ul>	R	X	X
D-5	Concept for learning activities 	R	X	
	<ul style="list-style-type: none"> <li>Define and design all learning activities (P)</li> </ul> <p>Provide the following (if relevant; based on chosen pedagogical approach and instructional design):</p> <ul style="list-style-type: none"> <li>Range of varied activities to engage and to motivate learners</li> <li>Authenticity of tasks in real life setting</li> <li>Activities promoting transfer of learning and application</li> <li>Hands-on activities</li> <li>Simulations to facilitate experiments</li> <li>Educational games (e.g., can be linked to case studies)</li> <li>Peer-review activities</li> <li>Interviews and interaction with practitioners and</li> </ul>	R	X	

	<ul style="list-style-type: none"> <li>field experts</li> <li>Webinars</li> <li>Interactive activities promoting social learning</li> <li>Activities promoting participation in the learning environment</li> <li>Activities promoting interaction between learners</li> <li>Activities promoting interaction within small group</li> <li>Activities promoting collaboration</li> <li>Panel discussion</li> <li>Additional and external resources for advanced learners</li> <li>Incremental increase on the difficulty level and workload (easy-start is recommended)</li> </ul>			
D-6	Technical concept   	X	X	R
	<ul style="list-style-type: none"> <li>Provide curated sources (e.g., blogs, infographics, websites, videos, articles) (P) (T)</li> </ul>	X	X	R
	<ul style="list-style-type: none"> <li>Embed technological tools (e.g., discussion forum, chat) to foster interaction, communication and experience sharing (P) (T) (S)</li> </ul>	X	X	R
	<ul style="list-style-type: none"> <li>Integrate technological tools (e.g., online documents, wiki, video conferencing) to enhance social learning, collaboration and community building (P) (T) (S)</li> </ul>	X	X	R
D-7	Media design  	R	X	X
	<ul style="list-style-type: none"> <li>Define and design all media (P) (T)</li> </ul> <p>Provide the following (if relevant; based on chosen pedagogical approach and instructional design):</p> <ul style="list-style-type: none"> <li>Video-lectures</li> <li>Digital text</li> <li>Text with audio explanation</li> <li>Text with video explanation</li> <li>Hypertext</li> <li>PPT Presentations with narration</li> <li>Animated PPT</li> </ul>	R	X	X
D-8	Communication concept  	R	X	
	<ul style="list-style-type: none"> <li>Define communication via emails, broadcast alerts, chat, forum (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Define communication with facilitator (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Define communication with fellow MOOC</li> </ul>	R	X	




	participants (P) (T)			
	<ul style="list-style-type: none"> <li>Define communication on a small group basis (P) (T)</li> </ul>	R	X	
D-9	Interaction concept  	R	X	
	<ul style="list-style-type: none"> <li>Design interaction with fellow MOOC participants (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Design interaction with facilitators (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Create opportunities for synchronous interaction with experts and practitioners (by topic, module, unit, weekly questions) (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Design interaction via Blogs, forums &amp; social media platforms to foster social learning (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Develop free mobile app to facilitate support network (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Provide regular coaching sessions in small group (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Create a community of learners (P) (T)</li> </ul>	R	X	
D-10	Feedback concept  	R	X	
	<ul style="list-style-type: none"> <li>Design automated feedback (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Design feedback by facilitator (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Design peer/group feedback moments with guidelines and rubrics (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Design weekly feedback from program leaders via video (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Provide prompt feedback for activities and tasks (P)</li> </ul>	R	X	
D-11	Concept for tests and assessment   	R	X	X
	<ul style="list-style-type: none"> <li>Design tests (topic/ unit/ thematic) with automated feedback (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Design weekly quizzes (to check for understanding of e.g., short sections of a topic/ unit) (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Design case study analysis and application (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Design assessment instruments to be aligned with content, weekly learning objectives and learner-profile (multiple choice does not do justice to advanced learners) (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Design assessment instruments that are able to test and evaluate specific desired learning outcomes (e.g., draw, design and formulate) (P) (T)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Embed gamification elements (e.g., badges in</li> </ul>			















	assessment instruments) (P) (T)			
	<ul style="list-style-type: none"> <li>Provide practical self-assessment strategies and techniques (e.g., digital video, online forms, rubrics, chats and reflection tools) (P) (T)</li> </ul>			
	<ul style="list-style-type: none"> <li>Design peer assessment with guidelines and scoring rubrics (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Design rubrics for peer-review (prior knowledge match to reduce gaps between pairs) (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Design rubrics for evaluation of final product (P) (T)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Define mind mapping and concept mapping for deep learning (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Design open assignment using scenario tools (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Design collaborative assignments and provide scaffolds to support the collaboration process (e.g., by intelligent teaching agents/tutors or cognitive tools) (P) (T)</li> </ul>			
	<ul style="list-style-type: none"> <li>Define formative assessment (e.g., provide open answers to distinguish excellent from average learners) (P) (T)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Define final product and artefact (P)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Define written exams and grades (P) (T) (S)</li> </ul>	R	X	
	<ul style="list-style-type: none"> <li>Design provision of feedback and answers for optional activities (P) (T)</li> </ul>	R	X	

 <b>Implementation</b>				
<b>I-1</b>	Content implementation  	R	X	X
	<ul style="list-style-type: none"> <li>Set up a content team with pedagogical coordinators (P) (T)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Provide a set of specific guidelines and instructions on learning objectives, content and its presentation, activities and assessment plan and procedure (P) (T)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Ensure content maintenance (P) (T)</li> </ul>	R		X
	<ul style="list-style-type: none"> <li>Re-use and adapt existing learning resources in terms of content and learning objectives (P) (T)</li> </ul>	R		X
	<ul style="list-style-type: none"> <li>Ensure new materials created for MOOCs are copyrighted by contributing authors and licensed under Creative Commons (P) (T)</li> </ul>	R		X
<b>I-2</b>	Design implementation  	R		X
	<ul style="list-style-type: none"> <li>Ensure effective use of graphical design to support learning (P) (T)</li> </ul>	R		X
<b>I-3</b>	Media implementation  	R		X
	<ul style="list-style-type: none"> <li>Consider the provision and the production of the required media (P) (T)</li> </ul>	R		X
<b>I-4</b>	Technical implementation  	X		R
	<ul style="list-style-type: none"> <li>Use open software platforms and open licenses (S)</li> </ul>	X		R
	<ul style="list-style-type: none"> <li>Use external service (e.g., You Tube) (T) (S)</li> </ul>	X		R
	<ul style="list-style-type: none"> <li>Use existing hardware infrastructure to host platforms (T) (S)</li> </ul>	X		R
	<ul style="list-style-type: none"> <li>Use technical platform (e.g., Open edX or moodle) that can integrate all tools useful for learners (T) (S)</li> </ul>	X		R
	<ul style="list-style-type: none"> <li>Integrate third-party tools for formative assessment (T) (S)</li> </ul>	X		R
	<ul style="list-style-type: none"> <li>Ensure technical maintenance (T)</li> </ul>	X		R
	<ul style="list-style-type: none"> <li>Set-up and sustain infrastructure, data security, documentation, and support (T) (S)</li> </ul>	X		R
<b>I-5</b>	Organization of use  	X	X	R
	<ul style="list-style-type: none"> <li>Provide detailed guidelines and instructions for facilitators and learners (P) (T)</li> </ul>	X	X	R
<b>I-6</b>	Testing and activation  	R		X
	<ul style="list-style-type: none"> <li>Ensure pilot testing of the MOOC and all the learning resources (P) (T)</li> </ul>	R		X

 <b>Realization</b>				
R-1	Administration  	X	X	R
	<ul style="list-style-type: none"> <li>Ensure sustained interaction amongst MOOC platform administrators, designers and facilitators to report bugs and propose operational improvements (P) (T)</li> </ul>	X	X	R
	<ul style="list-style-type: none"> <li>Set-up expert teams for MOOC platform, facilitation process and to control and to test learning outcomes (P) (T)</li> </ul>	X	X	R
	<ul style="list-style-type: none"> <li>Coordinate the facilitation process and actions of different facilitators (P) (T)</li> </ul>	X	X	R
	<ul style="list-style-type: none"> <li>Enforce profile setting with bio and picture to facilitate interaction and collaboration during the learning process (P) (T)</li> </ul>	X	X	R
R-2	Learning activities and related support   	X	R	X
	<ul style="list-style-type: none"> <li>Provide a Bootcamp module to orientate learners (P) (S)</li> </ul>	X	R	X
	<ul style="list-style-type: none"> <li>Provide comprehensive guidelines for tasks and activities (P) (S)</li> </ul>	X	R	X
	<ul style="list-style-type: none"> <li>Build an informal community of practice among facilitators to discuss issues and challenges (P)</li> </ul>	X	R	X
	<ul style="list-style-type: none"> <li>Categorize learners based on their proficiency level for rendering peer feedback (P)</li> </ul>	X	R	X
	<ul style="list-style-type: none"> <li>Provide exercises to train learners to give peer feedback (P)</li> </ul>	X	R	
	<ul style="list-style-type: none"> <li>Provide guidelines and scoring rubrics for peer-review (P)</li> </ul>	X	R	
	<ul style="list-style-type: none"> <li>Monitor peer-reviewed assignments and tasks by means of grading (P)</li> </ul>	X	R	
	<ul style="list-style-type: none"> <li>Create a learning experience that provides group support through small group interaction (3 to 7 learners) (P)</li> </ul>	X	R	
	<ul style="list-style-type: none"> <li>Create sub communities of interest based on themes and professional areas (P)</li> </ul>	X	R	
	<ul style="list-style-type: none"> <li>Foster community building of life-long learners of similar interest group (P)</li> </ul>	X	R	
	<ul style="list-style-type: none"> <li>Provide ample time for learners to engage with other learners (P)</li> </ul>	X	R	
	<ul style="list-style-type: none"> <li>Provide learning support using personas (P) (T)</li> </ul>	X	R	



	• Provide learning support for independent and reflective learning (P)	X	R	
	• Ensure regular feedback by facilitator (P) (T)	X	R	
	• Embed peer feedback as part of the collaborative and participatory culture (P) (T)	X	R	
	• Provide office-hours for students with questions and challenges (P) (T)	X	R	
	• Engage and support students in collaborative activities (P)	X	R	
	• Facilitate the formation of groups for collaborative learning	X	R	
	• Facilitate the collaboration process	X	R	
	• Assign two to three facilitators to manage forum and forward questions to experts (P) (T)	X	R	X
	• Organise interviews with content experts and practitioners (P)	X	R	X
	• Foster small group interaction on forums to reduce reading of posts (P)	X	R	
	• Leverage learners' questions as new discussion topics (P)	X	R	
	• Provide community teaching assistants to render feedback and support to learners (P) (S)	X	R	X
	• Enable learners to post their experiences with tasks and activities, as well as results (where applicable) for comments and feedback (P)	X	R	
	• Engage learners in higher-order thinking by means of questioning (P)	X	R	
	• Provide timely and consistent feedback (P)	X	R	
	• Provide weekly updates of videos, comments on forum posts (P) (T)	X	R	
	• Provide weekly highlights of students' good work and examples (P) (T)	X	R	
<b>R-3</b>	Review of competence levels   	R	X	X
	• Provide differentiated and optional assessments to distinguish competence levels (P) (T) (S)	R	X	X
	• Provide certification and accreditation if relevant (P) (T) (S)	R	X	X

 <b>Evaluation</b>				
E-1	Evaluation planning  	X	X	R
	<ul style="list-style-type: none"> <li>Identify evaluation objectives (e.g., reduce drop-outs, increase engagement and motivation, effective use of technological affordances to support learning, etc.) (P) (S)</li> </ul>	X	X	R
	<ul style="list-style-type: none"> <li>Specify the evaluation process and its frequency (e.g., regular intervals, periodic, theme-, module-, unit-based evaluation, etc.) (P) (S)</li> </ul>	X		R
	<ul style="list-style-type: none"> <li>Provide an evaluation focus (e.g., on learners: engagement, motivation, interaction, collaboration, technological affordances that support learning, learning outcomes) (P) (S)</li> </ul>	X		R
E-2	Evaluation realization   	X	X	R
	<ul style="list-style-type: none"> <li>Use surveys, questionnaires, interviews, etc. (P) (T) (S)</li> </ul>	X	X	R
	<ul style="list-style-type: none"> <li>Embed learning analytics tools to provide feedback on all learner activities (P) (T) (S)</li> </ul>	X	X	R
	<ul style="list-style-type: none"> <li>Use forum contributions and discussions as possible evaluation of learners' and groups' learning progress (P) (T)</li> </ul>	X	X	R
E-3	Evaluation review  	R	X	X
	<ul style="list-style-type: none"> <li>Adopt an after-action-review protocol involving all core stakeholders who are represented in the MOOC design team (P) (S)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Provide documentation of findings, reviews and analysis from learning analytics, other forms of data obtained in the course of the MOOC (P) (S)</li> </ul>	R	X	X
	<ul style="list-style-type: none"> <li>Identify specific area and provide recommendations for improvement (e.g., curriculum design and delivery requires differentiated course content and learning activities for two levels of learners) (P) (S)</li> </ul>	R	X	X
E-4	Improvements and optimization   	X	X	R
	<ul style="list-style-type: none"> <li>Set-up an evaluation consultation team to oversee the implementation of recommendations (resulting from the evaluation review process) (P) (T) (S)</li> </ul>	X	X	R
	<ul style="list-style-type: none"> <li>Provide regular interaction and collaboration with platform administrators and designers to report bugs and propose operational improvements (P) (T) (S)</li> </ul>	X	X	R

## 3.2 The QRF Quality Checklist

The following table presents the QRF Quality Checklist with leading questions for all three QRF dimensions: the phases and processes, the perspectives and the roles. The QRF Quality Checklist asks important questions and is intended for both novices and experts in MOOC design and development. Therefore, the QRF Quality Checklist serves as a starting point and a reminder on critical issues to be addressed during the MOOC design and development. It complements the QRF Key Quality Criteria that defines the phases and processes of the MOOC design and development.

As aforementioned, it is most important to note that MOOC designers, facilitators and providers have to select the appropriate and relevant phases and processes according to their situation, the learning objectives, target groups, context and condition. The same applies to the QRF Quality Checklist. Some processes or some of their quality indicators are pre-specified and (partly or completely) defined by pre-conditions and requirements (e.g., the available resources, budget and staff). Nevertheless, it is recommended to document also these processes defined by pre-conditions and requirements to ensure all stakeholders involved are duly informed.

Moreover, as already mentioned above, the QRF phases and processes are based on the adapted international ISO standard ISO/IEC 40180 (former ISO/IEC 19796-1). The QRF Key Quality Criteria for the five phases and their processes are derived from the results of the Global MOOC Quality Surveys, the semi-structured interviews and the workshops at international conferences organized by MOOQ.
















































Legend:	For the phases:	 = Analysis -  = Design -  = Implementation  = Realization -  = Evaluation "A-1" is a process
	For the perspectives:	 = Pedagogical -  = Technological -  = Strategic (P) = Pedagogical - (T) = Technological - (S) = Strategic
	For the roles:	 = Designer -  = Facilitator -  = Provider R = Responsible - X = Involved

Table 4: **The QRF Quality Checklist**








<div>  <b>Analysis</b> <div>    </div> </div>				
A-1	Initiation    <ul style="list-style-type: none"> <li>Who has to be involved to kick start the project planning and development? (P) (T) (S)</li> <li>Which MOOC examples from past exist, if any? (P) (T) (S)</li> <li>What is the envisaged timeframe? (P) (T) (S)</li> </ul>			R
A-2	Stakeholder identification   <ul style="list-style-type: none"> <li>Which different types of stakeholders are involved? (S) (e.g., learning designers, authors, experts, media designers, developers, technology providers, technical support, facilitators, evaluators, managers, board members, HR, marketing, public authorities, learners, customers, partners, others)</li> <li>Who are the target groups in relation to content, IT competency, prior experience in online and e-learning? (P) (S) (e.g., primary, secondary, indirect)</li> <li>Who are the involved internal stakeholders? (S) (e.g., primary, secondary)</li> <li>Who are the involved external stakeholders? (S) (e.g., primary, secondary)</li> </ul>	X		R
A-3	Definition of objectives    <ul style="list-style-type: none"> <li>What are the general pedagogical objectives? (P) (e.g., high quality, large scale, learner-orientation, thematic focus, collaboration)</li> <li>What are our general technological objectives? (T) (e.g., new functions, inhouse, outsourcing)</li> <li>What are our general economic objectives? (S) (e.g., profit, cost-covering, charitable)</li> <li>What are our general strategic objectives? (S) (e.g., learner support, future learners, marketing)</li> </ul>	R		R
A-4	Needs and demand analysis   <ul style="list-style-type: none"> <li>What are the needs and demands by the targeted learners? (P) (S) (e.g., small learning units, online collaboration and exchange, certification)</li> </ul>	X		R








	<ul style="list-style-type: none"> <li>What are the demands by the own organization? (S)</li> <li>What are the needs and demands by the market? (S)</li> <li>What are the demands by other stakeholders? (S)</li> </ul>			
A-5	<p>Analysis of the external context  </p> <ul style="list-style-type: none"> <li>Which other similar MOOCs exist, if any? (P) (S)</li> <li>Which potential partners exist? (P) (S)</li> <li>Which legal conditions or laws exist that affect the design, implementation and realization of the MOOC, if any? (S)</li> <li>Which evaluation, approval, certification or accreditation is required? (S)</li> </ul>			R
A-6	<p>Analysis of the organizational context   </p> <ul style="list-style-type: none"> <li>Which internal departments and units are involved? (S)</li> <li>Which pedagogical principles exist? (P) (S)</li> <li>Which spatial requirements exist? (P) (S)</li> <li>Which technology requirements exist? (P) (T) (S)</li> <li>Which economic specifications exist? (S)</li> <li>Which strategic requirements exist? (S)</li> </ul>	X		R
A-7	<p>Time, resources and budget planning  </p> <ul style="list-style-type: none"> <li>What is the timeframe? (S)</li> <li>Which staff categories are required? (S)</li> <li>Which internal staff can be deployed? (S)</li> <li>Which external staff has to be recruited or commissioned? (S)</li> <li>What are the costs of production of learning materials, (IT) resources, and hidden costs to design, develop and run the MOOC? (T) (S)</li> <li>Which budget is available? (S)</li> <li>How is the budget allocated? (T) (S) (e.g., staff, external contracts, technology, marketing)</li> <li>Is a detailed financial plan including a return on investment calculation and cost-benefit analysis developed? (S)</li> </ul>	X		R

















	Design			
D-1	<p>Learning objectives  </p> <ul style="list-style-type: none"> <li>What are the short-term, medium-term and long-term learning objectives? (P) (S)</li> <li>How are the learning objectives defined? (P) (e.g., knowledge, skills, competences, topic-driven, content-driven, target-group-driven, task-driven)</li> <li>Which entry-levels are the learning objectives addressing? (P) (e.g., beginners, intermediate, advance, novice, experts)</li> <li>How are the learning objectives assessed? (P) (S) (e.g., formative assessment, weekly quizzes, multiple choice tests, delivery of a product, essay, final exam)</li> </ul>	R	X	X
D-2	<p>Organizational concept and roles   </p> <ul style="list-style-type: none"> <li>How does the MOOC timeline look like? (P) (T) (S)</li> <li>Which roles are defined in the MOOC for each activity? (P) (e.g., learners, moderators, tutors, facilitators, experts, examiners, evaluators, content expert, pedagogy coordinator, technical expert, facilitator, examiner, moderator)</li> <li>Are synchronous sessions planned? If yes, with which kind of support? (P) (T)</li> <li>Which types of asynchronous sessions are planned with what kind of support? (P) (T)</li> <li>How are all roles and staff coordinated? (P) (T) (S) (e.g., the instructional alignment of the course: learning objectives, activities and assessment, duration)</li> <li>How are openness and free access guaranteed? (P)</li> </ul>	R	X	X
D-3	<p>Didactical concept and methods  </p> <ul style="list-style-type: none"> <li>What are the critical determinants that affect the decisions on didactical concept and methods? (P) (e.g., content, learning objectives, target group)</li> <li>Which didactical principle is focused? (P) (e.g., self-regulated learning, direct instruction, reflective learning, collaborative learning, emotional learning)</li> <li>Are personalization and selection of own learning pace and pathway realized? If, yes, how? (P) (T)</li> <li>Which curriculum is followed? (P)</li> <li>Which methodologies are used? (P)</li> </ul>	R	X	X










	<p>(e.g., active-learning oriented, learner-centered, network-oriented, task-based, interactive-based, problem-based)</p> <ul style="list-style-type: none"> <li>How are the didactical principle and methods communicated to the learners? (P) (e.g., orientation module, introductory unit, task guidelines)</li> <li>How are the didactical principle and methods realized in the MOOC platform? (P) (T)</li> <li>How are inclusion and equity guaranteed? (P) (T) (e.g., Web Content Accessibility Guidelines (WCAG) standards, special educational needs)</li> </ul>			
D-4	<p>Concept for content   </p> <ul style="list-style-type: none"> <li>What are the critical determinants that affect the decisions on type and volume of content? (P) (S) (e.g., market demand, needs-driven, learning objectives/ outcomes, target-group, entry level)</li> <li>Which topics are addressed? (P)</li> <li>How will the content be structured? (P) (e.g., entry level – beginners, intermediate, advance, novices, experts, units, modules, themes)</li> <li>Which amount of content is planned? (P)</li> <li>Which different media and presentation types of content are used? (P) (T)</li> <li>What are the sources for the content? (P) (T) (e.g., re-use, self development, contributions, external contracts, mixed approaches)</li> <li>How will the content be integrated? (P) (T)</li> <li>Which open licenses will be used for contents? (P) (T) (S)</li> </ul>	R	X	X
D-5	<p>Concept for learning activities </p> <ul style="list-style-type: none"> <li>What are the critical determinants that affect the decisions on activity types? (P) (e.g., content, learning objectives, target learners, learning effectiveness, engagement, motivational factors, didactical principle, methodology)</li> <li>What are the mandatory activities? (P)</li> <li>What are the optional and extended activities? (P)</li> <li>How are the activities structured? (P) (e.g., well-structured, ill-structured)</li> <li>What are the ranges of activities? (P) (e.g., knowledge generative, performative, applicational)</li> <li>What are the individual, peer and group activities? (P)</li> </ul>	R	X	




















	<p>(e.g., self-test quizzes, peer-reviewed activities, small group case study)</p> <ul style="list-style-type: none"> <li>How can learners monitor their learning progress? (P) (e.g., progress bar, weekly generated feedback or checklist)</li> <li>How is the teaching presence (experts, facilitators, teaching assistants) built into the activity types? (P) (e.g., interviews with experts, interaction with practitioners, webinars by experts, weekly, bi-monthly Q &amp; A with experts, live panel discussion)</li> </ul>			
D-6	<p>Technical concept   </p> <ul style="list-style-type: none"> <li>How will the MOOC platform be provided? (P) (T) (S)</li> <li>How is the scalability guaranteed? (T) (S)</li> <li>How will required modules and functions be defined, selected and added? (P) (T)</li> <li>How will data be collected, used and analysed for learning analytics and support according to privacy? (P) (T) (S)</li> <li>How will data be collected and used for additional purposes other than the MOOC running, if any? (P) (T) (S) (e.g., research data)</li> <li>How will external tools that cannot be added to the MOOC platform be integrated into the MOOC? (P) (T)</li> <li>How will the MOOC sessions be implemented? (P) (T)</li> <li>What kind of technical support will be offered for the staff and for the learners? (P) (T) (S)</li> <li>Which concept for maintenance will be followed? (P) (T) (S)</li> </ul>	X	X	R
D-7	<p>Media design  </p> <ul style="list-style-type: none"> <li>Which types of media will be used? (P) (T) (e.g., video lectures, digital text, animations, simulations)</li> <li>Which media concept will be followed? (P) (T) (e.g., interactive media)</li> <li>How will the media be designed? (P)</li> </ul>	R	X	X
D-8	<p>Communication concept  </p> <ul style="list-style-type: none"> <li>Which communication concept will be followed? (P) (T)</li> <li>Which support is required for the different types of communication? (P) (T)</li> </ul>	R	X	

D-9	<p>Interaction concept  </p> <ul style="list-style-type: none"> <li>• Which types of interaction will be used? (P) (T)</li> <li>• How will the interaction be designed? (P)</li> <li>• Which support is required for the different types of interaction? (P) (T)</li> </ul>	R	X	
D-10	<p>Feedback concept  </p> <ul style="list-style-type: none"> <li>• Which types of feedbacks will be given? (P) (T)</li> <li>• How will data and learning analytics used for feedback? (P) (T)</li> <li>• How and when will the feedbacks be provided? (P)</li> <li>• Which rubrics will be provided for the feedbacks? (P)</li> <li>• Which support is required for the different types of feedback? (P) (T)</li> </ul>	R	X	
D-11	<p>Concept for tests and assessment   </p> <ul style="list-style-type: none"> <li>• What are the critical determinants that affect the decisions on concept and instruments for tests and assessments? (P) (e.g., content, learning outcomes, target-group, entry-level)</li> <li>• Which concept for tests and assessments will be followed? (P) (T) (S) (e.g., formative assessment, summative assessment, authentic or work-integrated assessment, diagnostic assessment, criterion referenced assessment)</li> <li>• How are the tests and assessments rated? (P) (T) (e.g., grade system, scoring rubric system, point-system, reviews or comments)</li> <li>• What is the range of assessment tools used? (P) (T) (e.g., self-test, quizzes, peer-reviewed assessments, small group collaboration)</li> <li>• How do the learners get the results from the tests and assessments? (P) (T)</li> </ul>	R	X	X

 Implementation				
I-1	Content realization   <ul style="list-style-type: none"> <li>How will the content be produced and delivered? (P) (T)</li> </ul>	R	X	X
I-2	Design realization   <ul style="list-style-type: none"> <li>How will the graphical design be realized? (P) (T)</li> </ul>	R		X
I-3	Media realization   <ul style="list-style-type: none"> <li>How will the media be produced and provided? (P) (T)</li> </ul>	R		X
I-4	Technical realization   <ul style="list-style-type: none"> <li>How will the technical concept be realized? (T) (S)</li> <li>How will the technical requirements on scalability, accessibility, usability, infrastructure, security, privacy, services, support and documentation be realized? (T) (S)</li> <li>How will the maintenance be realized? (T)</li> </ul>	X		R
I-5	Organization of use   <ul style="list-style-type: none"> <li>How will the organizational concept of the MOOC (pedagogical and technical aspects) be realized? (P) (T)</li> </ul>	X	X	R
I-6	Testing and activation   <ul style="list-style-type: none"> <li>How will the MOOC and its learning resources be tested? (P) (T)</li> <li>How will the MOOC and its learning resources be adapted? (P) (T)</li> <li>How will the MOOC and its learning resources be activated? (P) (T)</li> </ul>	R		X

	<b>Realization</b>			
<b>R-1</b>	<p>Administration  </p> <ul style="list-style-type: none"> <li>How is the registration organized? (P) (T)</li> <li>How is topic-related feedback for the learners during the MOOC ensured? (P) (T)</li> <li>How is pedagogical feedback for the learners during the MOOC ensured? (P) (T)</li> <li>How is technical support for the learners, moderators and facilitators during the MOOC ensured? (P) (T)</li> </ul>	X	X	R
<b>R-2</b>	<p>Learning activities and related support   </p> <ul style="list-style-type: none"> <li>How are the learners inducted into the course and the pedagogical approach including the learning objectives, the course content, activity and assessment types, communication, interaction and feedback channels? (P) (S) (e.g., introductory unit, orientation week, instructional guide)</li> <li>Which pedagogical approach is realized? (P) (S)</li> <li>How is autonomous and self-regulated learning realized? (P) (T) (e.g., learning support for individual and reflective learning, learning support using personas, provide office-hours for students with questions/ challenges)</li> <li>How is network learning realized, if any? (P) (T) (e.g., provide tools and related tasks and assignments)</li> <li>How is group work realized, if any? (P) (T) (e.g., facilitate formation of small groups, provide small group support and related tasks and assignments)</li> <li>How is the communication process facilitated? (P) (T)</li> <li>How are forum and discussion platforms organized? (P) (T)</li> <li>How are the interaction activities realised? (P) (T)</li> <li>How is feedback provided? (P) (T) (e.g., automated, by peers, by facilitators, by community teaching assistants)</li> <li>How are reviews by educators and experts realized? (P) (T)</li> <li>How are peer reviews realized? (P) (T) (e.g., provide scoring-rubrics, provide exercises to</li> </ul>	X	R	X

	train learners to give peer reviews)			
R-3	Review of competence levels    <ul style="list-style-type: none"> <li>• Which types of optional assessments are offered? (P)</li> <li>• Which types of mandatory examinations are offered? (P) (S)</li> <li>• How is grading realized? (P) (T)</li> <li>• Which certificates are provided and how are they assessed and achieved? (P) (T) (S)</li> <li>• Which credits are provided and how are they assessed and achieved? (P) (T) (S)</li> </ul>	R	X	X

	Evaluation			
E-1	Evaluation planning   <ul style="list-style-type: none"> <li>Which evaluation objectives are defined? (S) (e.g., failure reduction, quality assurance, quality management, continuous improvement cycle)</li> <li>Which phases are covered by the evaluation? (S)</li> <li>How is the evaluation planning organized? (P) (S) (e.g., weekly, periodic, thematic, module-based)</li> <li>How is the evaluation designed? (P) (S) (e.g., evaluation categories, focus such as satisfaction, engagement, motivation, learning outcomes, impact, pedagogy, technology, organization, and constructs)</li> </ul>	X	X	R
E-2	Evaluation realization    <ul style="list-style-type: none"> <li>How is the evaluation realized and assessed? (P) (T) (S) (e.g., surveys, questionnaires, learning analytic tools, log data, observations, forums, interviews)</li> </ul>	X	X	R
E-3	Evaluation review   <ul style="list-style-type: none"> <li>How are the evaluation data reviewed, analysed and discussed? (P) (S)</li> <li>How are recommendations developed from the evaluation results? (P) (S)</li> </ul>	R	X	X
E-4	Improvements and optimization    <ul style="list-style-type: none"> <li>How are the evaluation recommendations used for improvements and optimization of the MOOC and its re-usage? (P) (T) (S)</li> <li>How are the evaluation recommendations used for improvements and optimization of the evaluation design and realization? (P) (T) (S)</li> </ul>	X	X	R

## 4. References and further results

The MOOQ initiative has published the following scientific articles:

Stracke, C. M., Tan, E., Texeira, A. M., Pinto, M., Kameas, A., Vassiliadis, B., & Sgouropoulou, C. (2018). Gap between MOOC designers' and MOOC learners' perspectives on interaction and experiences in MOOCs: Findings from the Global MOOC Quality Survey. In M. Chang, N.-S. Chen, R. Huang, Kinshuk, K. Moudgalya, S. Murthy, & D. G. Sampson (Eds.), *Proceedings 18th IEEE International Conference on Advanced Learning Technologies (ICALT)* (pp. 1-5). doi:10.1109/ICALT.2018.0000

Stracke, C. M., & Tan, E. (2018). The Quality of Open Online Learning and Education: Towards a Quality Reference Framework for MOOCs. In J. Kay, & R. Luckin (Eds.), *Rethinking learning in the digital age. Making the Learning Sciences Count: The International Conference of the Learning Sciences (ICLS) 2018* (pp. 1029-1032). doi:http://hdl.handle.net/1820/9909 Retrieved from [www.opening-up.education](http://www.opening-up.education)

Stracke, C. M., Sgouropoulou, C., Kameas, A., Vassiliadis, B., Texeira, A. M., & Pinto, M. (2018). Fostering Quality in MOOCs: a European Approach. In *Proceedings 18th European Conference on E-Learning (ECEL)*. ECEL: Athens. (accepted, in print)

Stracke, C. M., Kameas, A., Vassiliadis, B., Sgouropoulou, C., Texeira, A. M., Pinto, M., & Vidal, G. (2017). The Quality of Open Online Education: Towards a Reference Framework for MOOCs. *Proceedings of 2017 IEEE Global Engineering Education Conference (EDUCON)*, 1712-1715. doi:10.1109/EDUCON.2017.7943080

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[www.MOOC-quality.eu](http://www.MOOC-quality.eu)

This Quality Reference Framework (QRF) for MOOCs from the MOOQ initiative for the quality of MOOCs is available under an open and free Creative Commons license online at:

[www.MOOC-quality.eu/QRF](http://www.MOOC-quality.eu/QRF)



## About MOOQ, the European Alliance for the Quality of MOOCs:

MOOQ is the European Alliance for the Quality of Massive Open Online Courses, called MOOCs. The vision of MOOQ is to foster quality in MOOCs leading to a new era of learning experiences.



MOOQ's mission is to develop a quality reference framework for the adoption, the design, the delivery and the evaluation of MOOCs in order to empower MOOC providers for the benefit of the learners.

The main goal of MOOQ is therefore the development and the integration of quality approaches, new pedagogies and organisational mechanisms into MOOCs with a strong focus on the learning processes, methodologies and assessments.

To foster high quality Open Education and Learning in Europe and worldwide, MOOQ facilitates a new Q-generation of MOOCs that are designed, organized and tested as qMOOCs. This is realized in close collaboration with all interested partners and stakeholders in Europe and beyond.

MOOQ has achieved huge impact at the local, regional, European and international levels: **MOOQ could reach out to more than 100,000 MOOC learners, designers, facilitators and providers** through the MOOQ dissemination and exploitation activities.

In addition, in close cooperation with European and international institutions and associations, **MOOQ could involve in the QRF finalization more than 10,000 MOOC learners, designers, facilitators and providers** through the Global MOOC Quality Survey, the MOOQ presentations and workshops at regional, European and international conferences as well as communication and collaboration in traditional channels and social media.

## MOOQ promises: We will make MOOCs better!

More information about MOOQ online:

<http://www.mooc-quality.eu>

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MOOQ has been funded with support from the European Commission. This communication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein. MOOQ Project number: 2015-1-NL01-KA203-008950